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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. |
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09/336,401 06/18/99 SVIRCHEVSKI

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EXAMINER

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ART UNIT

PAPER NUMBER

1765
DATE MAILED:

02/27/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

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Office Action Summary

Application No.
09/336,401

Applicant(s)
Svirchevski et al.

Examiner
Lynette T. Umez-Eronini

Group Art Unit
1765



☐ Responsive to communication(s) filed on _____

☒ This action is **FINAL**.

☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claims

☒ Claim(s) 1-11 and 21-31 is/are pending in the application.

Of the above, claim(s) _____ is/are withdrawn from consideration.

☐ Claim(s) _____ is/are allowed.

☒ Claim(s) 1-11 and 21-31 is/are rejected.

☐ Claim(s) _____ is/are objected to.

☐ Claims _____ are subject to restriction or election requirement.

Application Papers

☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some* ☐ None of the CERTIFIED copies of the priority documents have been
☐ received.

☐ received in Application No. (Series Code/Serial Number) _____.

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

☒ Notice of References Cited, PTO-892

☒ Information Disclosure Statement(s), PTO-1449, Paper No(s). 9 and 11

☐ Interview Summary, PTO-413

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

— SEE OFFICE ACTION ON THE FOLLOWING PAGES —

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DETAILED ACTION

Information Disclosure Statement

1. Reference No. **L** in the information disclosure statement filed December 24, 2000 in Paper No. 9 has been considered.
2. The information disclosure statement filed December 15, 2000 in Paper No. 11 fails to comply with the provisions of 37 CFR 1.97, 1.98 and MPEP § 609 because no English translation has been provided for Reference No. **M** and **N** which are not in the English language. It has been placed in the application file, but the information referred to therein has not been considered as to the merits. Applicant is advised that the date of any re-submission of any item of information contained in this information disclosure statement or the submission of any missing element(s) will be the date of submission for purposes of determining compliance with the requirements based on the time of filing the statement, including all certification requirements for statements under 37 CFR 1.97(e). See MPEP § 609 ¶ C(1).

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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4. Claims 4 and 5 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claims 4 and 5, lines 2 and 3, "wherein the cleaning brush is a first cleaning brush" is indefinite because it is unclear what is meant by a first cleaning brush.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless —

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Gabriel (U. S. Patent No. 5,730,834).

Gabriel teaches a method of cleaning a surface of a semiconductor wafer following etching back a tungsten layer in an etching chamber using gaseous etchants (column 3, lines 4-44). The method comprises: rinsing the wafer with water heated to 50°C at 500 rpm (column 3, lines 56-58) suggest that rinsing is done under pressure and reads on using a non-splash rinse technique wherein the non-splash rinse technique being configured to quickly and evenly saturate the surface of the semiconductor wafer

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Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 2 -11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gabriel (US 5,730,834) as applied to claim 1 above, and further in view of Gockel et al. (US 5,809,832).

Gabriel differs in failing to specify processing variables as recited in **claims 3 and**

8.

It would have been obvious to one having ordinary skill in the art at the time of the claimed invention to employ any of a variety of operational variables such as those claimed by the applicant. They are well-known variables in the etching art and known to affect both the rate and quality of the etching process. The selection of a particular value would be optimized by conducting routine experimentation to obtain the best etched product.

Gabriel differs in failing to teach

scrubbing the surface of the wafer with a cleaning brush that applies a chemical solution to the surface of the wafer after the wetting in **claim 3;**

performing the wetting and scrubbing in a brush box in **claim 4;**

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setting a first delivery and a second delivery source over the surface of the wafer in order to wet the surface of the wafer with a flow rate of water **in claim 6**; and

setting the flow rate to be between 50 ml/minute and 300 ml/minute; setting a time of less than 4 seconds to wet substantially all of top surface of the wafer; rotating the wafer about a radial axis at a rate of between 3 and 20 rpm **in claims 6 and 8**.

Gockel teaches scrubbing the surface of a wafer with a cleaning brush that applies a chemical solution to the surface of the wafer after the wetting (column 8, lines 14-17); performing the wetting and scrubbing in a brush box (column 1, lines 28-41) wherein the brush box contains two brushes **511 and 512** which scrub both sides of the wafer (column 7, lines 49-52; Figure 5; column 15, lines 16-18 and Figure 14); setting a first delivery and a second delivery source over the surface of the wafer in order to wet the surface of the wafer with a flow rate of water (column 7, lines 50-52); and rotating the wafer (column 1, lines 18-20).

It would have been obvious to one having ordinary skill in the art at the time of the claimed invention to modify Gabriel by using the method of scrubbing a semiconductor wafer as taught by Gockel for the purpose of obtaining a contaminated free substrate.

9. Claims 21-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Masui et al. (US 5,916,687).

Masui teaches cleaning a contaminated semiconductor substrate **17** by applying ultrasonic-vibrating to a cleaning liquid that discharges through a nozzle onto a

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semiconductor surface (column 1, lines 5-10 and column 4, lines 7-39 and 54-59). It is well known in the art that contaminated wafer surfaces result from etching, hence the cleaning of the semiconductor as taught by Masui reads on a cleaning method following a plasma etching operation and wetting the surface of the semiconductor wafer by using a non-splash wetting technique.

Masui differs in failing to specify processing variables as recited in **claims 21-23, 25, and 27-31**.

It would have been obvious to one having ordinary skill in the art at the time of the claimed invention to employ any of a variety of operational variables such as those claimed by the applicant. They are well-known variables in the etching art and known to affect both the rate and quality of the etching process. The selection of a particular value would be optimized by conducting routine experimentation for the purpose of removing contaminants from a wafer surface.

Conclusion

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO**

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MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lynette T. Umez-Eronini whose telephone number is (703) 306-9074.


BENJAMIN L. UTECH
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700

ltue

February 23, 2001